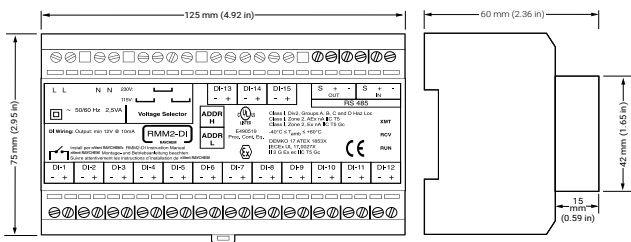# RMM2-DI

Trace-Heating Remote Monitoring Module for Digital Inputs

DESCRIPTION

The Remote Monitoring Module for Digital Inputs (nVent RAYCHEM RMM2-DI) provides the capability for the nVent RAYCHEM NGC controller family to read the status of devices remotely, like circuit breakers, and can link them back to the electrical heat-tracing circuits.

The RMM2-DI has in total 15 digital inputs. Multiple RMM2-DI units can communicate via a single RS485 cable with a single User Interface, providing centralized monitoring capabilities. Depending upon the control system selected the number of RMM2-DI units per system can differ. For technical assistance, call your local nVent representative or the nVent service center.

APPROVALS

CE EHC

RMM2-DI-8GL-EX-E and RMM2-DI-15GL-EX-E System

DEMKO 17 ATEX 1760X

IECEx UL 17.0026X

⟨Ex⟩ II 3 G

Ex ec IIC T5 Gc   Ex tc IIIC T60°C Dc   -40°C ≤ Tamb ≤ +60°C

RMM2-DI module

cULus LISTED

E490519
Proc. Cont Eq

Class I, Div2, Groups A, B, C and D Haz Loc
Class I, Zone 2, AEx nA IIC T5
Class I, Zone 2, Ex nA IIC T5 Gc
DEMKO 17 ATEX 1853X   IECEx UL 17.0027X   II 3 G Ex ec IIC T5 Gc

CONDITIONS OF SAFE USE

The equipment shall only be used in an area of at least pollution degree 2, as defined in EN/IEC 60664-1.

RMM2-DI UNIT

Specifications

Part number	1244-018083
EAN	5414506018479
Supply voltage (nominal)	115/230 VAC, ±10%, jumper selectable, 50/60 Hz
Power consumption	2,5 VA
Ambient operating range:	−40°C to +60°C (-40°C to 60°C)
Relative humidity:	5 to 95%, noncondensing
Digital Input:	2-wire, 12V, 10 mA minimal output
Digital Input wire connections:	2 x 1.5 mm2 cable (default). Terminals can handle 0.2 mm^2 to 4 mm^2 (AWG 12-24) for solid wire, 0.2 mm^2 to 2.5 mm^2 (AWG 14-24) for stranded wire
RS-485 connections:	Shielded, single twisted pair, max. 1,200 m (~3,900 feet)
Replaceable fuse:	F 200 mA/250 V, Wickmann part number 19370-034-K (FAST BLOW)

⚠ **WARNING:**   Explosion hazard. Do not remove or replace fuse when energized

TOOLS REQUIRED

- 7 mm flat-blade screwdriver
- 3 mm flat-blade screwdriver for conductor screws: Torque: min 0.5 NM, max 0.6 NM
- Wire stripper / cutter
- 27 mm spanner (for M20 glands)

PARTS (SUPPLIED)

- RMM2-DI
- RMM2-DI Trace-heating Remote Monitoring Module for Digital Inputs
- Replacement fuses
- Jumper for voltage selection

RMM2-DI LAYOUT
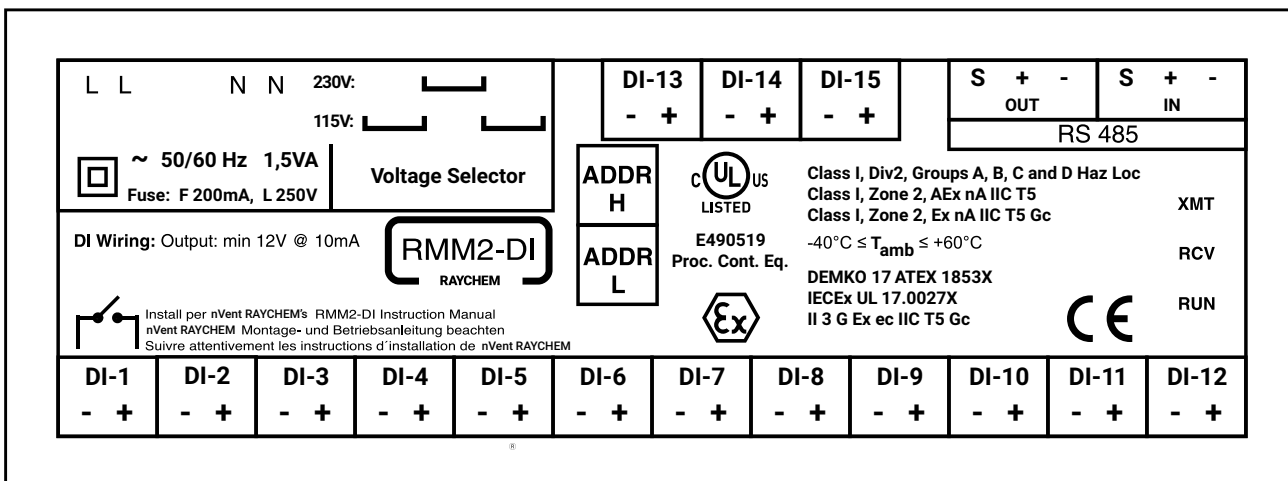
INSTALLATION OF RMM2-DI-XGL-EX-E MODULE IN ENCLOSURE IN HAZARDOUS AREAS

The RMM2-DI unit is available as hazardous area approved unit. The RMM2-DI is mounted in an enclosure and both together are approved for Hazardous Locations. The following table shows various hazardous area approved RMM2-DI-8GL-EX-E AND RMM2-DI-15GL-EX-E solutions. All units contain the RMM2-DI units inside the enclosure.

Part number	part description	Enclosure size [mm] x [mm] x [mm]	# RMM2-DI	# Glands for DI signals
1244-018858	RMM2-DI-8GL-EX-E	160x260x91	1	8
1244-018859	RMM2-DI-15GL-EX-E	160x360x91	1	15

All shipments include a replacement fuse and jumper for voltage selection.

Info: for convenience, the different part descriptions will be referenced as RMM2-DI-xGL-EX-E in this document, with the 'x' referring to the number of glands in the box for Digital Input signals.

⚠ WARNING:

This component is an electrical device. It must be installed correctly to ensure proper operation and to prevent frozen pipes, shock or fire. Read and carefully follow all the installation instructions.

INSTALLATION MATERIALS (NOT SUPPLIED)

• Fasteners: 4 screws for 6.5 mm holes for mounting enclosures

INSTALLATION PROCEDURE FOR THE RMM2-DI-XGL-EX-E

• Mount RMM2-DI-xGL-EX-E enclosure and install cables

• Connect power and earth wiring and select voltage operating range

• Connect RTD cables to the RMM2-DI-xGL-EX-E

NOTES

– Installation to be performed by suitable trained personnel

– Keep the RMM2-DI clean and dry prior to installation to avoid damage to internal components

– When RMM2-DI is used for DIN-rail installation in a local customised panel or enclosure, an additional 10 earth terminals for earthing of RTDs and power cables is needed. Terminals shall be able to handle wires from 0.2 to 4 mm2

MOUNT RMM2-DI-XGL-EX-E ENCLOSURE AND INSTALL CABLES

The enclosure is suitable for use in Zone2 areas. Do not mount the enclosure in Zone 1 or Zone 0 areas. For installations in Zone 1 areas contact nVent. Mount the enclosure using suitable screws (Hole diameter 6 mm). Install power cables, RS485 cable(s) and Digital Input cables into the enclosure using glands supplied. Keep stopping plugs in unused entries

INSTALLATION AND CONFIGURATION PROCEDURE RMM2-DI

The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP54 in accordance with EN/IEC 60079-7.

MODBUS ADDRESS

The Modbus address is set via 2 hexadecimal rotary switches. ADDR H is setting the high address number; ADDR L is for the low address number. See appendix A for conversion between hexadecimal and decimal address range.

INSTALLATION OF POWER SUPPLY AND EARTH WIRING

• Select the voltage operating range. Connect the supplied wire jumpers to the appropriate terminals to select input voltage. The RMM2-DI is supplied jumpered for 230 volts.

• Connect wiring from power source to designated terminals on RMM2-DI. Use only copper conductors. Connect power cable wires to the terminals marked L and N on the RMM2-DI. If power is being daisy chained, be sure to maintain polarity of L and N wiring for incoming and outgoing wires. The terminals accept stranded wires from 0.2 – 2,5 mm2. (0,2 - 4 mm2 solid wire).

INSTALLATION DIGITAL INPUT WIRING

• Connect Digital Input cables to the RMM2-DI

Remark: The RMM2-DI has two terminals per Digital input. The Minimum power per DI connection supplied by RMM2-DI module is 12V 10mA (Sink/source). The resistance of the sum of the closed contact plus the resistance of the wire to and from the contact may not exceed 10 Ohm.

RECORD THE LOCATION/IDENTIFICATION FOR EACH DIGITAL INPUT

RMM2-DI terminal number	Device identification on drawing #	Device Tag description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

## RS-485 MODBUS ADDRESS AND WIRING

SELECT nVent RAYCHEM RS-485 ADDRESS AND CONNECT THE RS-485 BUS CABLES

• Each RMM2-DI connected to a nVent RAYCHEM NGC-control and monitoring system must have a unique address; if two RMM2-DIs are assigned the same address, communication faults will result. To ensure that an unique address to each RMM2-DI unit has been assigned, apply the following

– Review the nVent RAYCHEM NGC system layout; if a layout document does not exist, create one. If it has not already been done, assign an RS-485 address to each RMM2-DI (up to 255)

– If you are adding one or more RMM2-DI units to an existing RAYCHEM NGC network, confirm that the RS-485 addresses for existing RMM2-DI units correspond to the system layout. See for details the programming guide of the RAYCHEM NGC system. By checking the RS-485 addresses on an existing system, you can avoid potential conflicts that would be confusing and time consuming to troubleshoot otherwise. Record the RS-485 address selected for the Remote Monitoring Module you are currently installing, and label the exterior of the enclosure with the address assigned to the RMM2-DI. See for address range and hexadecimal address switch appendix A.

- Do not make connections to the RS-485 bus while it is connected to an operating RAYCHEM NGC network. Damage and/or alarms could result. The RS-485 bus allows units with unique addresses to be connected together along a common bus. To add a new unit to the network, simply connect the RS-485 bus from the last unit to the new one, or insert the new unit between two existing units on the bus. The order in which units are attached to the RS-485 bus does not matter. There are just two constraints on the RS-485 network

  – Each RMM2-DI must be assigned a unique address

  – The RS-485 bus must be a continuous string from the first network device to the last RMM2-DI in the system.
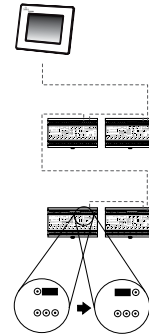
  NOTE

  The RS-485 bus operates at 5 V, and equipment connected to it could be damaged by exposure to higher voltages.
  Take precautions to avoid exposing the RS-485 wiring to discharge of static electricity or other sources of high voltage potential; in particular, avoid contact with the power supply wiring.

  The RMM2-DI has two sets of terminals for connections to the RS-485 bus. One terminal block allows the RMM2-DI to connect to the RS-485 bus, the second allows a continuation of the bus to other RMM2-DI units on the network. Observe polarity, which is indicated on the RMM2-DI. Connect the incoming RS-485 bus to the set of terminals marked "IN", observing the polarity noted on the cover of the RMM2-DI; use the terminal marked "S" for the shielof the RS-485 cab le. Connect the continuation of the RS-485 bus to the set of terminals marked "OUT" in the same manner (not required for the last RMM2-DI in the network).

IMPORTANT: Do not connect the shield of the RS-485 cables to the general provided grounding terminal. Connect the shield only to the RMM2-DI terminals provided. To avoid the potential for spurious ground loops, the RS-485 cable shield should be connected to ground only in the RAYCHEM unit. For the last RMM2-DI in the network, terminate the RS-485 bus by removing the shorting block on jumper location from 2–3 and placing it across pins 1–2 (See drawing).

Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)
1	0,1	36	2,4	71	4,7	106	6,A	141	8,D
2	0,2	37	2,5	72	4,8	107	6,B	142	8,E
3	0,3	38	2,6	73	4,9	108	6,C	143	8,F
4	0,4	39	2,7	74	4,A	109	6,D	144	9,0
5	0,5	40	2,8	75	4,B	110	6,E	145	9,1
6	0,6	41	2,9	76	4,C	111	6,F	146	9,2
7	0,7	42	2,A	77	4,D	112	7,0	147	9.3
8	0,8	43	2,B	78	4,E	113	7,1	148	9,4
9	0,9	44	2,C	79	4,F	114	7,2	149	9,5
10	0,A	45	2,D	80	5,0	115	7,3	150	9,6
11	0,B	46	2,E	81	5,1	116	7,4	151	9,7
12	0,C	47	2,F	82	5,2	117	7,5	152	9,8
13	0,D	48	3,0	83	5,3	118	7,6	153	9,9
14	0,E	49	3,1	84	5,4	119	7,7	154	9,A
15	0,F	50	3,2	85	5,5	120	7,8	155	9,B
16	1,0	51	3,3	86	5,6	121	7,9	156	9,C
17	1,1	52	3,4	87	5,7	122	7,A	157	9,D
18	1,2	53	3,5	88	5,8	123	7,B	158	9.E
19	1,3	54	3,6	89	5,9	124	7,C	159	9,F
20	1,4	55	3,7	90	5,A	125	7,D	160	A,0
21	1,5	56	3,8	91	5,B	126	7,E	161	A,1
22	1,6	57	3,9	92	5,C	127	7,F	162	A,2
23	1,7	58	3,A	93	5,D	128	8,0	163	A,3
24	1,8	59	3,B	94	5,E	129	8,1	164	A,4

Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)
25	1,9	60	3,C	95	5,F	130	8,2	165	A,5
26	1,A	61	3,D	96	6,0	131	8,3	166	A,6
27	1,B	62	3,E	97	6,1	132	8,4	167	A,7
28	1,C	63	3,F	98	6,2	133	8,5	168	A,8
29	1,D	64	4,0	99	6,3	134	8,6	169	A,9
30	1,E	65	4,1	100	6,4	135	8,7	170	A,A
31	1,F	66	4,2	101	6,5	136	8,8	171	A,B
32	2,0	67	4,3	102	6,6	137	8,9	172	A,C
33	2,1	68	4,4	103	6,7	138	8,A	173	A,D
34	2,2	69	4,5	104	6,8	139	8,B	174	A,E
35	2,3	70	4,6	105	6,9	140	8,C	175	A,F
176	B,0	192	C,0	208	D,0	224	E,0	240	F,0
177	B,1	193	C,1	209	D,1	225	E,1	241	F,1
178	B,2	194	C,2	210	D,2	226	E,2	242	F,2
179	B,3	195	C,3	211	D,3	227	E,3	243	F,3
180	B,4	196	C,4	212	D,4	228	E,4	244	F,4
181	B,5	197	C,5	213	D,5	229	E,5	245	F,5
182	B,6	198	C,6	214	D,6	230	E,6	246	F,6
183	B,7	199	C,7	215	D,7	231	E,7	247	F,7
184	B,8	200	C,8	216	D,8	232	E,8	248	F,8
185	B,9	201	C,9	217	D,9	233	E,9	249	F,9
186	B,A	202	C,A	218	D,A	234	E,A	250	F,A
187	B,B	203	C,B	219	D,B	235	E,B	251	F,B
188	B,C	204	C,C	220	D,C	236	E,C	252	F,C
189	B,D	205	C,D	221	D,D	237	E,D	253	F,D
190	B,E	206	C,E	222	D,E	238	E,E	254	F,E
191	B,F	207	C,F	223	D,F	239	E,F	255	F,F
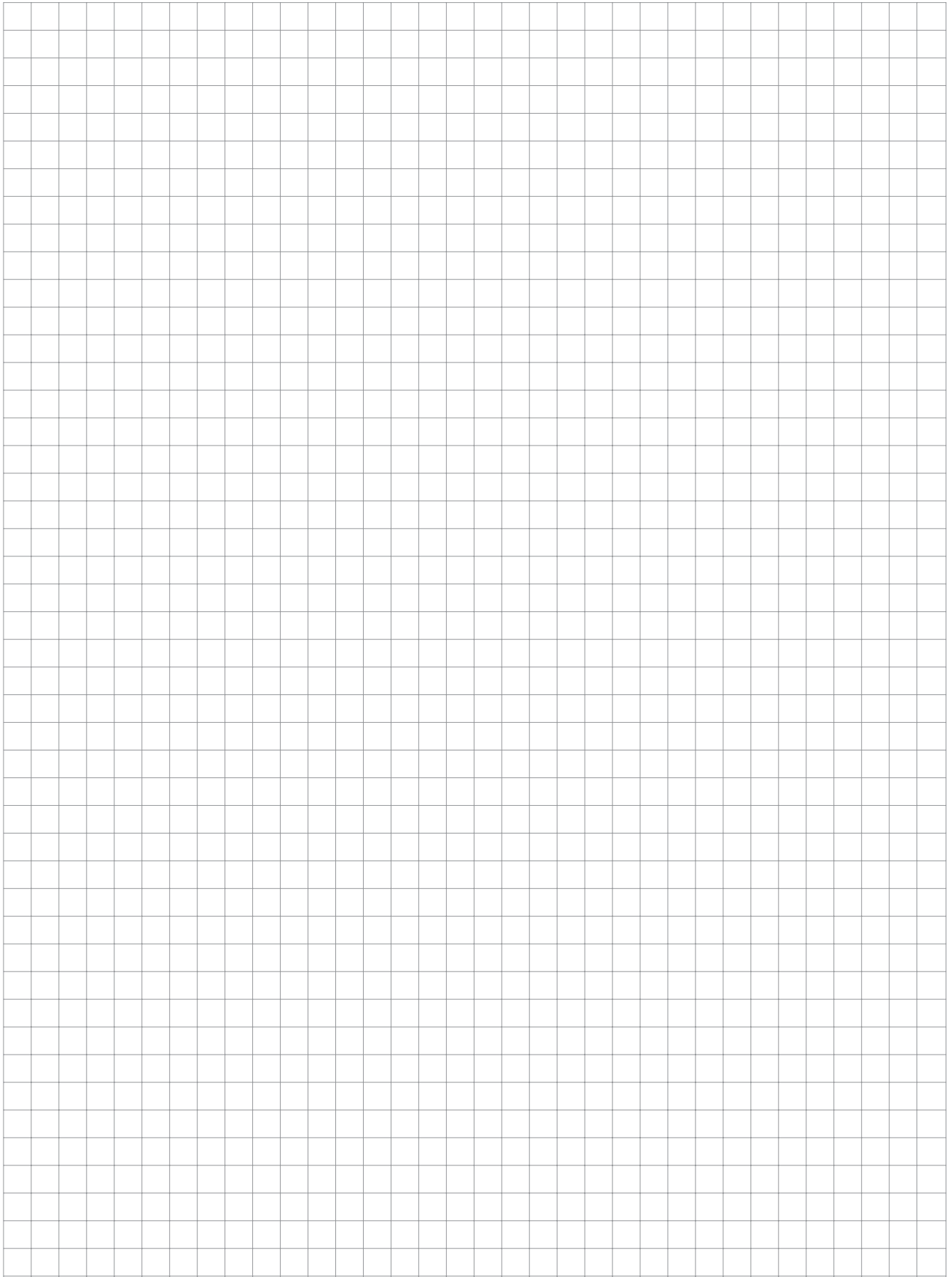
United Kingdom

Tel   0800 969 013
Fax   0800 968 624
salesthermalUK@nVent.com

Ireland

Tel   1800 654 241
Fax   1800 654 240
salesIE@nVent.com

SEA

Tel   +65 67685800
Fax   +65 67322263

Australia

Tel   +61 2 97920250
Fax   +61 2 97745931

India - Noida

Tel   +91 120 464 9500
Fax   +91 120 464 9548
NTMinfome@nVent.com

India - Mumbai

Tel   +91 22 6775 8800/01
Fax   +91 22 2556 1491
NTMinfome@nVent.com

UAE

Tel   +971 4 378 1700
Fax   +971 4 378 1777
NTMinfome@nVent.com

nVent.com